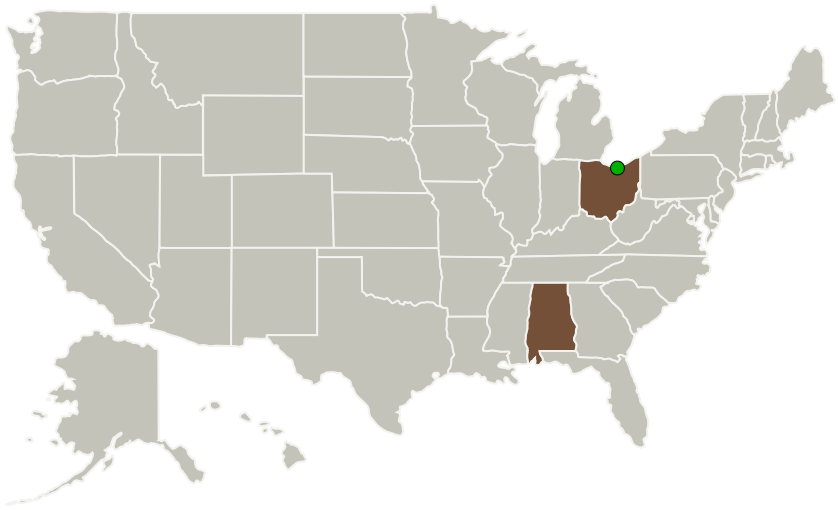
Dual Use Catalytically Initiated Combustor (CIC) for Rocket Engine Ignition and Thruster Applications, Phase I

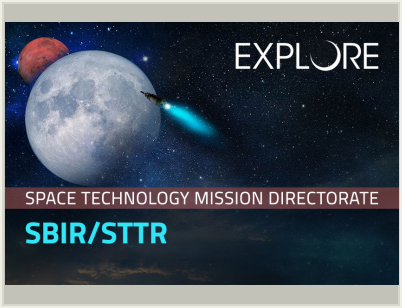
Completed Technology Project (2011 - 2011)

Project Introduction

This proposal responds to subtopic O2.02 "Propulsion Technologies" and the stated need to develop component technologies that will lead to future propulsion systems that are reliable and have adequate performance without requiring excessive specialized handling equipment and procedures or needing to push materials and designs to the limits of their capabilities. We propose the development of a low part count and low energy Catalytically Initiated Combustor (CIC) that can serve as a rocket engine igniter as well as the basis for a family of low cost and highly reliable launch vehicle and satellite thrusters. We propose a 6-month Phase I program to 1) demonstrate reliable ignition and operation of our baseline CIC with hydrogen, methane, and propane fuels, 2) demonstrate reliable ignition and operation of our baseline CIC under cold gas inlet conditions, 3) demonstrate extended duration hot fire testing and durability of our CIC design over multiple ignition cycles, and 4) demonstrate rapid pulsed operation necessary for a launch vehicle or space craft thruster application. Under our proposed Phase I effort, we will also conduct a market survey of potential customers and define a flight weight CIC with maximum commercial utility as either an igniter or small thruster.

Primary U.S. Work Locations and Key Partners





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Organizations Performing Work	Role	Type	Location
K T Engineering Corporation	Lead Organization	Industry	Madison, Alabama
Glenn Research Center(GRC)	Supporting Organization	NASA Center	Cleveland, Ohio

Primary U.S. Work Locations	
Alabama	Ohio

Project Transitions

February 2011: Project Start

September 2011: Closed out

Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/138106)*

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

K T Engineering Corporation

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

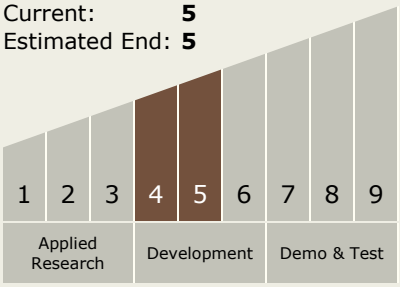
Carlos Torrez

Principal Investigator:

Greg Z Saks

Technology Maturity (TRL)

Start: **4**
Current: **5**
Estimated End: **5**



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Technology Areas

Primary:

- TX01 Propulsion Systems
  - TX01.1 Chemical Space Propulsion
    - TX01.1.2 Earth Storable

Target Destinations

The Moon, Mars, Outside the Solar System, The Sun, Earth, Others Inside the Solar System